

Borehole

50-00-06**Log Event A**

Borehole Information

Farm : <u>T</u>	Tank : <u>T</u>	Site Number : <u>299-W10-55</u>
N-Coord : <u>43,271</u>	W-Coord : <u>75,700</u>	TOC Elevation : <u>672.34</u>
Water Level, ft :	Date Drilled : <u>9/30/1944</u>	

Casing Record

Type : <u>Steel-welded</u>	Thickness, in. : <u>0.237</u>	ID, in. : <u>5</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>150</u>	
Type : <u>Steel-welded</u>	Thickness, in. : <u>0.406</u>	ID, in. : <u>12</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>103</u>	
Type : <u>Steel-welded</u>	Thickness, in. : <u>0.280</u>	ID, in. : <u>6</u>
Top Depth, ft. : <u>103</u>	Bottom Depth, ft. : <u>150</u>	

Cement Bottom, ft. : 150 Cement Top, ft. : 0

Borehole Notes:

Borehole 50-00-06 was drilled in September 1944, concurrent with tank farm construction, and completed at a depth of 150 ft. The borehole was constructed with 12-in.-diameter casing from the ground surface to about 100 ft and then extended to 150 ft with 6-in.-diameter casing. A cement (grout) plug was placed at the bottom of the 6-in. casing and the casing was cut off at 90 ft; the portion of the 6-in. casing between the ground surface and 90 ft was removed. The 12-in. casing is perforated from 50 to 90 ft, and the 6-in. casing is perforated from 90 to 150 ft.

This borehole was apparently modified when 5-in.-diameter casing was placed inside the 12-in. and 6-in.-diameter casings. There is no information on how deep the 5-in. casing extends, but for this report it is assumed to be the total depth of the borehole (150 ft). Grout is also assumed to be present between the casings along with several intervals of grout plugs. Because of the uncertainties in the borehole construction, log data for this borehole were processed on the assumption that the borehole is double cased throughout the length, with 12-in. and 5-in. casings from the ground surface to 103 ft and 6-in. and 5-in. casings from 103 ft to the bottom of the logged interval (147.5 ft).

The top of the 5-in. casing, which is the zero reference point for the SGLS, is even with the ground surface.

Equipment Information

Logging System : <u>2B</u>	Detector Type : <u>HPGe</u>	Detector Efficiency: <u>35.0 %</u>
Calibration Date : <u>10/1997</u>	Calibration Reference : <u>GJO-HAN-20</u>	Logging Procedure : <u>MAC-VZCP 1.7.10-1</u>

Logging Information

Borehole

50-00-06**Log Event A**

Log Run Number :	<u>1</u>	Log Run Date :	<u>01/30/1998</u>	Logging Engineer:	<u>Alan Pearson</u>
Start Depth, ft.:	<u>0.0</u>	Counting Time, sec.:	<u>200</u>	L/R : <u>L</u>	Shield : <u>N</u>
Finish Depth, ft. :	<u>30.0</u>	MSA Interval, ft. :	<u>0.5</u>	Log Speed, ft/min.:	<u>n/a</u>

Log Run Number :	<u>2</u>	Log Run Date :	<u>02/02/1998</u>	Logging Engineer:	<u>Alan Pearson</u>
Start Depth, ft.:	<u>29.0</u>	Counting Time, sec.:	<u>200</u>	L/R : <u>L</u>	Shield : <u>N</u>
Finish Depth, ft. :	<u>77.0</u>	MSA Interval, ft. :	<u>0.5</u>	Log Speed, ft/min.:	<u>n/a</u>

Log Run Number :	<u>3</u>	Log Run Date :	<u>02/03/1998</u>	Logging Engineer:	<u>Alan Pearson</u>
Start Depth, ft.:	<u>76.0</u>	Counting Time, sec.:	<u>200</u>	L/R : <u>L</u>	Shield : <u>N</u>
Finish Depth, ft. :	<u>130.0</u>	MSA Interval, ft. :	<u>0.5</u>	Log Speed, ft/min.:	<u>n/a</u>

Log Run Number :	<u>4</u>	Log Run Date :	<u>02/04/1998</u>	Logging Engineer:	<u>Alan Pearson</u>
Start Depth, ft.:	<u>147.5</u>	Counting Time, sec.:	<u>200</u>	L/R : <u>L</u>	Shield : <u>N</u>
Finish Depth, ft. :	<u>129.0</u>	MSA Interval, ft. :	<u>0.5</u>	Log Speed, ft/min.:	<u>n/a</u>

Logging Operation Notes:

This borehole was logged in four log runs. The total logging depth achieved by the SGLS was 147.5 ft. This borehole was logged with the SGLS operating in the move-stop-acquire mode, stopping every 6 in. and collecting spectra data for 200 s.

Analysis Information

Analyst : R.R. SpatzData Processing Reference : MAC-VZCP 1.7.9Analysis Date : 09/09/1998**Analysis Notes :**

The pre-survey and post-survey field verification for each logging run met the acceptance criteria established for peak shape and system efficiency. The energy calibration and peak-shape calibration from the calibration spectrum that most closely matched the field data were used to establish the peak resolution and channel-to-energy parameters used in processing the spectra acquired during the logging operation.

A casing correction factor for a 0.650-in.-thick steel casing was used from 0 to 103 ft; a factor for a 0.50-in. steel casing was used from 103 to 147.5 ft. A correction factor for the annular grout was not applied because none is available.

Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations. Uncertainty bars on the plots show the statistical uncertainties for the



Spectral Gamma-Ray Borehole
Log Data Report

Page 3 of 3

Borehole

50-00-06

Log Event A

measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made and natural radionuclides, and the total gamma derived from the spectral data. A historical gross gamma log was not available for review. Monitoring of this borehole was suspended in April 1975 because the casing was reported to be misaligned.

Results/Interpretations:

The radionuclide concentrations identified are only apparent concentrations and should be considered underestimated.

The only man-made radionuclide detected in this borehole was Cs-137. Cs-137 contamination was detected continuously from 0.5 to 2 ft at concentrations ranging from 0.2 (MDL) to 2 pCi/g. Cs-137 contamination occurs intermittently from 110 ft to the bottom of the logged interval (147.5 ft) at concentrations ranging from the MDL to 0.6 pCi/g. The maximum Cs-137 concentration for this borehole was 2 pCi/g detected at 1 ft.

The K-40 concentrations increase slightly from a general background of about 7 pCi/g above 41 ft to about 11 pCi/g from 41 to 47 ft. The K-40 concentrations noticeably decrease to less than 5 pCi/g at 49 ft and to about 2 pCi/g at 60 ft. K-40 concentrations are 12 pCi/g from 50 to 57 ft. Between 65 and 82 ft, the K-40 concentrations gradually increase from 8 to 11 pCi/g. Th-232 concentrations increase noticeably at 85 ft. The KUT concentrations decrease dramatically below 92 ft and then increase noticeably at 109 ft. The K-40 concentrations below 109 ft are about 14 pCi/g and remain at about this level to the bottom of the logged interval (147.5 ft).